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Air and Radiation Docket
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Re: Supplemental Comments by the North Dakota Department of Health and the State of North Dakota on EPA'S Proposed Rule Revisions

Prevention of Significant Deterioration (PSD) New Source Review:
Refinement of Increment Modeling Procedures

Docket ID No.: EPA-HQ-OAR-2006-0888

Dear Administrator Johnson:

Thank you for the opportunity to file additional comments on EPA's proposed prevention of significant deterioration (PSD) rulemaking in the above docket.[1] For the reasons stated below, the North Dakota Department of Health (NDDOH)[2] continues to support EPA's proposed amendments to the PSD rules[3]—40 C.F.R. § 51.166 (PSD rules for SIP-approved states) and 40 C.F.R. § 52.21 (PSD rules for PSD non-SIP states). These comments primarily address comments filed by those opposing these clarifications of long-standing PSD rules and policies.

[1] Notice of this rulemaking was published in the federal register at 72 Fed. Reg. 31,372-399 (June 6, 2007). The rulemaking docket was reopened for further public comment at 72 Fed. Reg. 49,678 (August 29, 2007).
[2] The NDDOH is responsible for administering North Dakota's EPA-approved State Implementation Plan (SIP), including its PSD provisions. *See* 40 C.F.R. §§ 1820-1837.
[3] The amended rules are at 72 Fed. Reg. 31,397-399.

I. The PSD rule amendments in this rulemaking are not new, but merely clarify already existing options for tracking increment consumption in the CAA and long-standing PSD rules.

Many filing comments in this rulemaking claim that the proposed rule amendments made at 72 Fed. Reg. 31,397-399 significantly change the current PSD rules. This is not true. A comparison of the long-standing definition of "actual emissions" to the definition of "actual emissions" in the proposed rule shows that the amendments are consistent with the current PSD rule but clarify long-standing ambiguities that need to be clarified. This section will compare and summarize the original and current definitions of "actual emissions" with the changes proposed in this rulemaking.

The reasons EPA added an "actual emissions" definition in 1980 was summarized in Section IIB, pages 13-22 of our August 6, 2007, comments filed in this rulemaking. But those comments did not compare the original definition of "actual emissions" to either the current definition of "actual emissions" or the definition of "actual emissions" proposed in these rules for determination of increment construction. Such a comparison will lay the foundation needed to reply to many factually and legally inaccurate comments filed in this rulemaking.

The current definition of "actual emissions" in the PSD rules was first adopted in 1980, and has remained largely unchanged since then. The 1980 definition of "actual emissions" provided:

> (21)(i) "Actual emissions" means the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with subparagraphs (ii)-(iv) below.
>
> (ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. The reviewing authority may allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating

hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

(iii) The reviewing authority may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

(iv) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

Rule 51.24(b)(21),[4] 45 Fed. Reg. 52,675, 52,732 (August 7, 1980).

The current definition of "actual emissions" in the PSD rules is:

(21)(i) Actual emissions means the actual rate of emissions of a regulated NSR pollutant from an emissions unit, as determined in accordance with paragraphs (b)(21)(ii) through (iv) of this section, except that this definition shall not apply for calculating whether a significant emissions increase has occurred, or for establishing a PAL under paragraph (w) of this section. Instead, paragraphs (b)(40) and (b)(47) of this section shall apply for those purposes.

(ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation. The reviewing authority shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

(iii) The reviewing authority may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

[4] When finalized, it became 40 C.F.R. § 51.24(b)(21). The definition for "actual emissions" in 1980 Rule 51.21(b)(21) is identical. *See* 45 Fed. Reg. at 52,737.

(iv) For any emissions unit that has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

40 C.F.R. § 51.166(b)(21).

A comparison shows that—but for the exception added at the end of § (b)(21)(i) and the change of language from “a two-year period” to “a consecutive 24-month period” in § (b)(21)(ii)—the 1980 and the current definition of “actual emissions” in the PSD rules are identical.

The corresponding relevant provisions of the definition of “actual emissions” in the proposed amendments to 40 C.F.R. § 51.166 in this rulemaking are:

(b)(21)(i) *Actual emissions means the actual rate of emissions of a regulated NSR pollutant from an emissions unit, as determined in accordance with paragraphs (b)(21)(ii) through (iv) of this section*, *except that this definition shall not apply for calculating whether a significant emissions increase has occurred, for establishing a PAL under paragraph (w) of this section,* or for determining consumption of ambient air increments. *Instead, paragraphs (b)(40), (b)(47),* and (f)(1) of this section *shall apply for those purposes.*

* * * * *

(f) Methods for determining increment consumption.

(1) Actual emissions. For purposes of determining consumption of the ambient air increments set forth in paragraph (c) of this section, the plan shall define "actual emissions" in accordance with paragraphs (f)(1)(i) through (vii) of this section.

(i) Actual emissions shall be calculated based on information that, in the judgment of the reviewing authority, provides the most reliable, consistent, and representative indication of the emissions from a unit or group of units in an increment consumption analysis as of the baseline date and on subsequent dates. *In general, actual emissions for a specific unit should be calculated using the unit's actual operating hours, production rates, and types of materials processed,*

stored, or combusted during the selected time period. However, where records of actual operating hours, production rates, and composition of materials are not available or are incomplete, the reviewing authority shall use its best professional judgment to estimate these parameters from available information in accordance with the criteria in this paragraph. When available and consistent with the criteria in this paragraph, data from continuous emissions monitoring systems may be used.

(ii) *In general, when evaluating consumption of an increment averaged over an annual time period, actual emissions as of a particular date in an increment consumption analysis (the applicable baseline date or the current time period) shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation.*

(iii) When evaluating consumption of an increment averaged over a period of less than 1 year (i.e., 24-hour or 3-hour averaging), actual emissions as of a particular date in an increment consumption analysis (the applicable baseline date or the current time) *may equal the average rate, for the applicable averaging time, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date.* The average rate may be calculated by dividing an annual rate by the number of hours the unit was actually operating over the annual period. <u>The reviewing authority may use an actual maximum rate over a 24-month period when sufficient data are available to produce a consistent, reliable, and representative analysis of the change in emissions from baseline to the current time period.</u>

(iv) *The reviewing authority may allow actual emissions to be based on a different time period than the 24 months preceding a particular date upon a determination that such period is more representative of normal source operation as of the particular date, based upon credible information showing that the unit's operations in the 24 months preceding the date were not typical of operations as of the particular date.* A period after the particular date may be used, but only if such period is more representative of normal source operations as of the

particular date. Operations occurring prior to a particular date are not representative of normal source operations for a particular date if they permanently ceased more than 24 months prior to that date. The different time period shall be a consecutive 24-month period unless two non-consecutive 12-month periods are demonstrated to be more representative of normal source operation as described above.

(v) *The reviewing authority may use source-specific allowable emissions for the unit instead of the actual emissions of the unit.*

(vi) For any modified emissions unit that has not resumed normal operations on the date of an increment consumption analysis, the actual emissions on the date the source begins operation shall equal the projected actual emissions of the unit on that date. *For any new emissions unit that has not begun normal operations on the date of an increment consumption analysis, the actual emissions on the date the new source begins operations shall equal the potential to emit for that source.*

(vii) To the extent any requirement of this paragraph (f)(1) conflicts with a recommendation in appendix W of this part, paragraph (f)(1) shall control.

72 Fed. Reg. at 31,397.

The *italicized* language in the above proposed amendments shows where the language in the proposed "actual emissions" definition closely follows or mirrors the definition of "actual emissions" in the current rule quoted above (40 C.F.R. § 51.166(b)(21)) and the nearly identical language first adopted in 1980 (also quoted above). The language that is not italicized is the additional clarifying language that is being added in this rulemaking. The underlined language in (f)(1)(iii) is the language added to the definition of "actual emissions" that incorporates into the PSD rules for the first time the "maximum actual emission rate" concept as a possible emission rate for calculating short-term (e.g., 3-hour and 24-hour) increment consumption that was first proposed (but never adopted into rule) in 1990 in the DRAFT New Source Review Workshop Manual, at p. C.49 (October 1990).

Before discussing the comments, it is useful to outline what the changes to the PSD rules are and their purpose and sources:

- The change to (b)(21)(i) in the proposed rule amendment clarifies that the definition of "actual emissions" in (f)(1) will apply to analyses and calculations that will determine "consumption of ambient air increments."

- The introductory language to (f)(1) makes clear that the definition of "actual emissions" in that subsection applies to increment consumption analyses conducted to determine compliance with "ambient air increments set forth in paragraph (c)" of 40 C.F.R. § 51.166.

- The first sentence of (f)(1)(i) sets forth the criteria that will apply in determining the baseline and current emission rates that will be used in doing increment consumption analyses. The standard it sets is high. The emission rates the reviewing authority chooses must be "the most reliable, consistent, and representative indication of the emissions from a unit or group of units in an increment consumption analysis as of the baseline date and on subsequent dates." When the "reviewing authority" is the state agency delegated under the state implementation plan (SIP), as it usually is, this sentence will provide the standard to be applied by the "reviewing authority" in doing its NSR or periodic review. It will also provide the standard for review to be used by EPA as the oversight agency, and by any reviewing court, in reviewing the emission rates chosen by the NSR permit applicant or the facilities undergoing a periodic review. This standard does not exist in the current PSD rules, and adding it provides needed guidance to state and federal agencies and to the courts on an issue that has needed to be addressed since the first PSD rules were initiated.[5]

- The second sentence of (f)(1)(i) closely follows the last sentence of (b)(21)(ii) in both the current and 1980 PSD rules in

[5] *See* 38 Fed. Reg. 18,986 (July 16, 1973).

describing how actual emissions are to be calculated. It restates the general rule that emission rates must be based on "the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period."

- The last two sentences of (f)(1)(i) are needed because emissions data available now are much better and more complete than the emissions data that were available during the baseline period (e.g., December 1977 in North Dakota). Continuous emissions monitoring systems (CEMS) data are the most obvious example of higher quality and more robust data available now that were not available in the late 1970s or early 1980s when the minor source baseline date was triggered in most states and air quality regions. In addition, EPA's initial policy in 1978, before the "actual emissions" definitions and policy were promulgated in 1980, involved tracking only increment consuming emissions at allowable rates.[6] This meant that extensive baseline emissions inventories were not done in North Dakota and other places at the minor source baseline date, because the rule did not require it at that time and the 1980 "actual emissions" rule did not become effective until later. Docket Exhibit 83, "Prevention of Significant Deterioration Sulfur Dioxide Final Baseline Emission Rates" (May 2003)[7] provides an example of the "site-specific, record-specific, and facility-specific issues that can only be decided by exercising judgment on numerous technical and fact-specific questions."[8] The second to last sentence of (f)(1)(i) creates a "best professional judgment" standard that applies "where records of actual operating hours, production rates, and composition of materials are not available or are incomplete," and incorporates the ""the most reliable, consistent, and representative indication of the emissions from a unit or group of units in an increment consumption analysis as of the baseline date and on

[6] *See*, e.g., The PSD Variance Issue in North Dakota, Final Report August 18, 2005, EPA-HQ-OAR-2006-0888-0011.8, pages 8-9; North Dakota's SO2 PSD Air Quality Modeling Final Report, EPA-HQ-OAR-2006-0888-0011.1, p. 11.

[7] NDDOH has forwarded Exhibit 83 and the rest of the record from North Dakota's periodic review by mail to become a part of this rulemaking record.

[8] NDDOH August 6, 2007, comment letter, EPA-HQ-OAR-2006-0888-0590.1, p. 13.

subsequent dates" standard from the first sentence into the "best professional judgment" standard. The last sentence makes clear that CEMS data may be used when it meets the criteria set forth in the rule.

- Subsection (f)(1)(ii) follows and clarifies the "actual emissions" rate that should be used, as a general rule, to calculate compliance with the annual increment. This rate is "the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation." This is the same general rule that has applied under the first sentence of (b)(21)(ii) in both the current and 1980 PSD rules in describing how actual emissions are to be calculated. The option to use allowable emissions as an alternative—which has existed under (b)(21)(iii) in both the current and 1980 PSD rules in describing how actual emissions are to be calculated—remains an alternative under (f)(1)(v).

- The first sentence of subsection (f)(1)(iii) and subsection (f)(1)(v) clarify that the average rate of emissions and allowable emissions may continue to be used as ways of calculating consumption of short-term increments as allowed in the first sentence of (b)(21)(ii) and (b)(21(iii) of the current and 1980 PSD rules. The second sentence clarifies that the average rate of emissions is to be calculated by dividing the total emissions by the number of operating hours over the representative period, not the total hours in the two year period. The last sentence of subsection (f)(1)(iii) (the underlined language) is, as noted previously, the language added to the definition of "actual emissions" that incorporates into the PSD rules, for the first time, the "maximum actual emission rate" concept as a possible emission rate for calculating short-term (e.g., 3-hour and 24-hour) increment consumption. This was first proposed (but never adopted into rule) in 1990 in the DRAFT New Source Review Workshop Manual, at p. C.49 (October 1990). Since these provisions are the focus of many of the comments filed so far, the next section of this letter will discuss this issue in more detail.

- Subsection (f)(1)(iv) clarifies the second sentence of (b)(21(ii) of the current and 1980 PSD rules. The added language clarifies the meaning of "normal source operation" which was adopted into the definition of "actual emissions" in the 1980 rules. The preamble to the 1980 rules explained how the "normal source operation" term in the actual emission definition was to be understood and applied:

> Unlike the June 1978 policy, baseline concentration will no longer routinely include those emissions increases after the baseline date from sources contributing to the baseline concentration, which are due to increased hours of operation or capacity utilization. Existing policy permitted this grandfathering, provided such increases were allowed under the SIP and reasonably anticipated to occur as of the baseline date. Today's policy which normally excludes such increases is consistent with using actual source emissions to calculate baseline concentrations. An actual emissions policy, however, does allow air quality impacts due to production rate increases to sometimes be considered as part of the baseline concentration. If a source can demonstrate that its operation after the baseline date is more representative of normal source operation than its operation preceding the baseline date, the definition of actual emissions allows the reviewing authority to use the more representative period to calculate the source's actual emissions contribution to the baseline concentration. EPA thus believes that sufficient flexibility exists within the definition of actual emissions to allow any reasonably anticipated increases or decreases genuinely reflecting normal

source operation to be included in the baseline concentration.

45 Fed. Reg. 52,675, 52,714 (August 7, 1980).

- The second sentence of subsection (f)(1)(vi) closely follows subsection (b)(21(iv) of the current and 1980 PSD rules. The first sentence of subsection (f)(1)(vi) addresses the issue of what emission rate should be used when a source is being modified at the time of an increment analysis.

- Subsection (f)(1)(vii) addresses which regulation controls in the event that the rules promulgated here conflict with the Appendix W guideline document. Our comments filed on August 6, 2007, state some of the reasons why this is needed: (1) Appendix W does not mention or discuss rule-defined "baseline concentration" or "actual emissions"; and (2) Appendix W recognizes flexibility in application of models is needed at 40 CFR Part 51 at §§ 1.a, 1.c, 1.d, 1.e and 8.0.a, and CAA § 165(e)(3)[9] requires such flexibility. For example, section 1.c of Appendix W states: "[T]he diversity of the nation's topography and climate, and variations in source configurations and operating characteristics dictate against a strict modeling 'cookbook'."[10] *See Responses to Recurring Issues,* EPA-HQ-OAR-2006-0888-0590.3, p. xix, p. 14, n. 26; *Technical Comments on EPA's Proposed Rule Revisions*, EPA-HQ-OAR-2006-0888-0590.2, pages 2 and 7-8.

The above comparison shows, in sum, that the PSD rule amendments in this rulemaking are not new, but merely clarify already existing options for tracking increment consumption in the CAA and long-standing PSD rules. The clarifications address ambiguities that have long existed in the rules. The added language does not change the substance of those long-standing rules, and are consistent with long-standing interpretations and policy. Nor do these amendments alter existing options for calculating increment consumption for either annual or short-term

[9] 42 U.S.C. § 7475(e)(3).
[10] Compare to the last sentence of CAA § 165(e)(3), 42 U.S.C. § 7475(e)(3).

emissions—average rate, maximum, and allowable all remain options. In fact, using maximum emissions is raised from guideline status by being included in these amendments. But the changes make the criteria for using each of these options clearer. These changes are needed, and are a proper exercise of EPA's discretion under the law.

II. Comments filed in this rulemaking show why clarification of the rules that apply to using short-term emissions in calculating increment consumption is needed, and why Congress was wise to include a requirement for using monitoring as a means of testing the accuracy of modeling outputs. But clarification of the long-standing discretion of states under the CAA and PSD rules to use monitoring to check the accuracy of modeling outputs may be needed so that the use of monitoring as an accuracy-assessment tool can be more easily used when models are over-predicting or under-predicting short-term increment consumption.

A. The "Gulf Coast" and "paper offsets" problems identified in the preamble to the 1980 PSD rules—when "actual emissions" were first promulgated as the means for measuring increment consumption—occur for short-term increment calculations as well as annual increment calculations, and demonstrate the need to use monitoring to assess model accuracy.

In Environmental Defense v. Duke Energy Corp., 127 S. Ct. 1423 (2007) and in New York v E.P.A., 443 F.3d 880 (D.C. Cir. 2006), *cert. denied* 127 S.Ct. 2127 (2007), New York and several of the environmental groups who filed comments in this rulemaking took the position that actual rather than allowable or maximum potential emissions should be used to determine whether an increase in annual emissions occurs that will trigger new source review (NSR). In contrast, several of these same entities are taking the position in this rulemaking that allowable or maximum emission rates, rather than actual emissions (as defined in the rule as the average rate per hour of emissions), must be used for calculating short-term increment consumption in NSR.

As discussed in the previous section, the proposed rules (subsections (f)(1)(iii) and (f)(1)(v)) will allow states and EPA to use either average rate,

or allowable, or maximum emissions as alternative ways of calculating short-term increment consumption. The (f)(1)(i) criteria—that is, that the option chosen "shall be calculated based on information that, in the judgment of the reviewing authority, provides the most reliable, consistent, and representative indication of the emissions from a unit or group of units" and requires the reviewing authority to exercise their "best professional judgment"—will apply in reviewing the emission rate the reviewing authority (usually the state) chooses. Apparently it is the position of New York and the environmental groups that "average rate" emissions may never be used as an option to calculate short-term increment consumption, even in cases when average-rate emissions provide (1) "the most reliable, consistent, and representative indication of the emissions from a unit or group of units," (2) the most accurate results for short-term increment consumption when compared to the monitoring data, and (3) "Gulf Coast" and "paper offsets" problems arise because "maximum" or "allowable" rates greatly over-predict short-term increment consumption when compared to monitoring data. Using maximum or allowable baseline short-term rates may result in very high short-term emission rates from those baseline sources that do not consume any increment that are not representative of ambient conditions at the baseline date. This may be inconsistent with the definition of "baseline concentration" in the Act, because the "baseline concentration" definition requires not only that the annual, but also that the short-term, baseline concentrations be representative of "the ambient concentration levels which exist at the time of the first application for a permit in an area subject to this part." Clean Air Act (CAA) § 169(4), 42 U.S.C. § 7479(4) (definition of "baseline concentration" in the PSD "part" of the CAA). The examples below will show these problems.

Section IIB, EPA-HQ-OAR-2006-0888-0590.1, pages 13-22, of NDDOH's August 6, 2007, comments provide background to why the "actual emissions" became the method for tracking increment consumption after the *Alabama Power II* decision, and the "Gulf Coast" and "paper offsets" issues that arose out of NDDOH doing draft modeling for a major modification permit application for Minnkota in 1999, which eventually triggered the PSD periodic review NDDOH conducted in 2002-2005. As we discussed in our August 6 letter, the "Gulf Coast" problem occurs when using highest allowable or potential emissions greatly over-predicts

increment consumption because actual emissions are significantly lower.[11] The "paper offsets" problem occurs when baseline sources can emit all the way up to their maximum hourly baseline emission rate 24 hours per day, 365 days per year, without consuming any increment.[12] Several examples demonstrate, in North Dakota at least, the "Gulf Coast" and "paper offset" problems exist for short-term increment consumption calculations as well as for annual emission calculations. They also demonstrate why Congress was wise to include monitoring as a way to test the accuracy of modeling outputs as discussed in our August 2007 comments, EPA-HQ-OAR-2006-0888-0590.1, pages 47-49.

1. A comparison of average rate, allowable, and maximum emissions as defined by (f)(1)(iii) and (f)(1)(v) of the proposed rule above.

The bottom gray line (plot i) of the graph on page 17 of the attached Supplemental Comments on EPA's Proposed Rule Revisions (Attachment A to this letter) shows a graph of the sum of the hourly sulfur dioxide (SO2) emissions from the 13 coal-fired electric utilities in North Dakota for each hour over a two year period (2000-2001). The blue line (plot h) on the graph is the "average rate" emissions defined by 40 C.F.R. § 51.166(b)(21)(ii) quoted in the previous section of these comments and North Dakota's equivalent PSD rule, which is also the "average-rate" as defined in (f)(1)(iii). Both Table 1 on page 8 of Attachment A and the frequency distribution graph on page 18 of Attachment A show that the rule-defined "average rate" emissions (plot h) are approximately at the 74th percentile of all the combined emissions for all the sources in the 2000-2001 two-year period. Electric load requirements vary based on demand and facilities are shut down for maintenance and other reasons.

The "average emission" rate (plot-line h on the graph) in this case is 38,474.5 lbs per hour for these 13 units. The 38,474.5 lbs per hour contains both baseline and increment consuming emissions, so when that is modeled it provides a total predicted concentration that can be compared to the monitored concentrations taken at the same receptor. This is the emission rate that NDDOH used to determine compliance with the 3-hour and 24-hour SO2 Class I increments. It is also the emission rate that, after

[11] EPA-HQ-OAR-2006-0888-0590.1, pp. 19-20.
[12] *Id.* at pp. 18-19.

it was modeled, NDDOH compared to the highest monitored 24-hour readings in the Class I areas and found in its accuracy analysis that the "average rate" emissions (plot-line h) resulted in model-predicted 24-hour concentrations that were higher than the highest monitored concentrations.

Plot-line f of the graph on page 17 of Attachment A is the 100th percentile or highest combined hourly emission rate of all 13 sources over the 2000-2001 period (in other words, line f represents the hour that had the highest combined emission rate of all 13 sources of the 17,304 hours in the 721 days in that two-year period). This highest emission rate for one hour (plot-line f) was 49,832.9 lbs for that hour (see graph legend on page 16 of attachment A). Plot-line g of this graph is the 90th percentile emissions used by Region 8 in their draft modeling that are relevant to these 13 sources (47,344 lb/hr).

Plot-line c is the permit-allowable maximum emissions rate as defined by (f)(1)(v) (i.e., the "allowable" rate)(64,339lb/hr). Since the maximum allowable rate is defined in North Dakota's permits by the maximum permit-allowable 3-hour rolling average, this maximum average rate is multiplied by the number of hours in a year to get the maximum emissions in 24-hour period or a year. The left column in Attachments D and E to this letter show a calculation of the maximum annual permit allowable emissions for the 13 electric utility major sources in North Dakota. These are the emission rates that NDDOH historically used to calculate increment consumption before it identified the "Gulf Coast" and "paper offset" problems after doing additional review of its draft modeling for the Minnkota facility that eventually triggered its 2002-2005 periodic review proceedings.

All other plot-lines on the graph on page 17 of Attachment A—plot-lines a, b, b', d, and e—show the different possible maximum emission rates as defined by the last underlined sentence of (f)(1)(iii) above as well as the "maximum emission" method from the draft 1990 *New Source Review Workshop Manual* that appears to be incorporated by reference into the last sentence of (f)(1)(iii). The draft 1990 *New Source Review Workshop Manual* method maximum emissions—and the way to calculate increment consumption based on maximum emissions—as follows:

> For each short-term averaging period (24 hours and less), the change in the actual ***emissions rate*** for the particular averaging period is calculated as the difference between:
>
> - *the current maximum actual **emissions rate**, and*
> - *the maximum actual **emissions rate** as of the minor source baseline date (or major source baseline date for applicable major stationary sources undergoing construction before the minor source baseline date).*
>
> In each case, the maximum rate is the highest occurrence for that averaging period during the previous 2 years of operation.

DRAFT *New Source Review Workshop Manual* (October 1990), p. C.49 (emphasis by italics and bold in original).

All maximum-emission-rate data are from hourly CEMS data collected from each source. Plot-lines a, b, b', d, and e, represent different possible maximum 3-hour and 24-hour emission rates based on different interpretations of the last underlined sentence of (f)(1)(iii) above and the "maximum emission" rate method from the draft 1990 *New Source Review Workshop Manual* above.

The different numbers for maximum 3-hour emissions (a & b) and maximum 24-hour emissions (d & e) arise because it is unclear under how to treat sources that are bubbled under the permit under the definition in the last underlined sentence of (f)(1)(iii) above and the "maximum emission" rate method from the draft 1990 *New Source Review Workshop Manual* quoted above that appears to be incorporated by reference—i.e., whether to choose the maximum 3-hour (a) and 24-hour (d) emissions from each stack, or to choose the maximum combined 3-hour (b) and 24-hour (e) emissions from the two bubbled stacks.

Plot-line b' on page 17 of Attachment A is an attempt to come up with a rough estimate of non-excluded emissions to deal with the problem of the exclusion of "temporary" emissions such as maintenance, start-up, shutdown, and malfunction emissions that are required to be eliminated when compiling the maximum emissions inventory. *See* section 2, pages 4-6, of Attachment A, which discusses this issue in more detail. The highest

emission rates from each source identified in plot-lines a, b, d, and e of the graph are very likely temporary emissions that are excluded from consideration, but that is a fact-specific issue that must be determined on an emission-by-emission, hour-by-hour basis. Since North Dakota has never used the 1990 *New Source Review Workshop Manual* draft guidance ("Puzzlebook") approach to calculating short-term emissions quoted above, we do not have the maximum emissions data after the exclusion of the "temporary" emissions available. Nor is it practical in North Dakota to use maximum emissions for reasons that will be explained shortly (i.e., problems with identifying the baseline short-term emissions that must be subtracted from the current maximum emissions under the page C.49 "Puzzlebook" definition quoted above). Texas identified and summarized the "temporary emissions" issue in their comment letter from Glenn Shankle, Executive Director, Texas Commission on Environmental Quality (TCEQ), EPA-HQ-OAR-2006-0888-0615.1, page 4, as follows:

> The EPA should clarify to what extent "temporary" emissions such as maintenance, start-up, shutdown, and malfunction emissions are required to be considered when compiling the emissions inventory. Related EPA guidance in Appendix Y to Part 51 (Guidelines for BART Determinations Under the Regional Haze Rule), notes the following when determining emissions estimates: "The emissions estimates used in the models are intended to reflect steady-state operating conditions during periods of high capacity utilization. We do not generally recommend that emissions reflecting periods of start-up, shutdown, and malfunction be used, as such emission rates could produce higher than normal effects than would be typical of most facilities. We recommend that States use the 24 hour average actual emission rate from the highest emitting day of the meteorological period modeled, unless this rate reflects periods start-up, shutdown, or malfunction."

NDDOH agrees with Texas's comment, but with the caveats relating to the difficulty of determining maximum–short-term emissions during the baseline period discussed above and below.

In summary, the bottom gray line (plot i) of the graph on page 17 of the Attachment A to this letter shows a graph of the sum of the hourly sulfur

dioxide (SO2) emissions from the 13 coal-fired electric utilities in North Dakota for each hour over a two-year period (2000-2001). The blue line (plot h) on the graph is the "average rate" emissions defined by 40 C.F.R. § 51.166(b)(21)(ii) quoted in the previous section of these comments and North Dakota's equivalent PSD rule, which is also the "average-rate" as defined in proposed (f)(1)(iii). Plot-line c is the permit-allowable maximum emissions rate as defined by proposed (f)(1)(v) (i.e., the "allowable" rate)(64,339lb/hr), which is also in current PSD rule at (b)(21)(iii) quoted earlier in these comments. Plot-lines a, b, b', d, and e, show different possible maximum emission rates as defined by the last underlined sentence of (f)(1)(iii) above as well as the "maximum emission" rate definition from the draft 1990 *New Source Review Workshop Manual* that appears to be incorporated by reference into the last sentence of (f)(1)(iii) for the reasons, and with the caveats, explained above.

This graph will be referred to in discussing the challenges and problems that arise when using allowable and maximum emission rates to calculate short-term (3-hour and 24-hour) increment consumption in the next sections of these comments. These challenges and problems can be summarized as follows:

- When either allowable or maximum emissions are used, the models greatly over-predict short-term increment consumption when compared to the highest monitored readings at the same receptor in the modeling domain (the "Gulf Coast" problem); and
- When either allowable or maximum emissions are used, baseline sources may emit maximum short-term emissions all the way up to either their maximum allowable rate during the baseline period ((b)(21)(iii) and (f)(1)(v)), or their highest maximum baseline emission rate as defined on page C.49 of the Puzzlebook as quoted above, <u>without consuming any short-term increment</u> (the "paper offsets" problem). In fact, as the following examples will show, very high maximum emissions over a short period of time during the baseline period may completely skew the short-term baseline, and may make the short-term increments meaningless, because they are so much higher than the highest short-term actual air quality conditions during the baseline period. That is, in short, why Congress was

wise to require monitoring as a way to bring model-predicted concentrations back to earth in CAA § 165(e),[13] and why Congress was wise to require that the "baseline concentration" be tied to "the ambient concentration levels which exist at the time of the first application for a permit in an area subject to this part," consistent with the definition of "baseline concentration" in CAA § 169(4).[14]

The comments in sections 3-6, pages 6-15, of Attachment A, discuss other bias and judgment aspects of these issues, and some suggestions useful to their solution, that are incorporated by reference, and need not be repeated here.

2. An over-prediction or "Gulf Coast" problem was created in NDDOH's initial draft modeling and periodic review when allowable or maximum short-term emissions are used to determine short-term increment consumption.

The blue line (plot-line h) in the graph on page 17 of Attachment A represents the "average rate" emissions defined by 40 C.F.R. § 51.166(b)(21)(ii) quoted earlier in these comments and North Dakota's equivalent PSD rule, which is also the "average-rate" as defined in proposed (f)(1)(iii). As discussed in our August 6th comments and attachments, when NDDOH did an accuracy assessment during our periodic review, we determined that the models were still over-predicting the 24-hour increment consumption when compared to the highest 24-hour monitoring data when average-rate emissions were modeled.

All the emission rates above plot-line h in the graph are greater then the emissions represented in plot-line h. The over-prediction problem that still exists in North Dakota, at least, when average-rate emissions are used increases with each higher emission rate represented by each higher plot-line on the graph. In other words, the "Gulf Coast" over-prediction problem increases with each higher emission rate from bottom to top. As discussed above, other than plot-lines f and g, plot-lines a, b, b', d, and e, show different possible maximum emission rates as defined by the last

[13] 42 U.S.C. § 7475(e).
[14] 42 U.S.C. § 7479(4).

underlined sentence of (f)(1)(iii) above as well as the "maximum emission" rate definition from the draft 1990 *New Source Review Workshop Manual,* and plot-line c represents the allowable emission rate.

The graph does not show "*the maximum actual* ***emissions rate*** *as of the minor source baseline date (or major source baseline date for applicable major stationary sources undergoing construction before the minor source baseline date)*" which also must be established to calculate short-term increment consumption under the Puzzlebook approach (page C.49) to calculating short-term increment consumption quoted above. To make an apples-to-apples increment consumption analysis based on current maximum emissions and baseline maximum emissions, it is necessary to determine the maximum baseline emissions for each source. As the following two examples show, this is often very difficult to establish. New York and the environmental groups fail in their comments to show whether or how states that claim they are using maximum emissions are establishing this required maximum baseline rate, so the Puzzlebook definition and methodology can be used.

a. Example 1: Problems in North Dakota with establishing "the maximum short-term actual emissions rates for the 3-hour and 24-hour increments as of the minor source baseline date" under the Puzzlebook approach because the sulfur content of lignite coal varies by a factor of four, and no CEMS data is available from the baseline period.

Establishing current maximum short-term emissions rates for 3-hour and 24-hour emissions has become easier since CEMS data became available for some major sources because of Title IV monitoring requirements, if the problematic "temporary" emissions issues discussed above are addressed. But reconstructing the maximum short-term actual emissions rates for the same facilities for the 3-hour and 24-hour increments as of the minor source baseline date is difficult, in North Dakota at least, for several reasons:

- No equivalent short-term CEMS data is available from the baseline period.

- Lignite coal varies by a factor of four in sulfur content: "The sulfur content of lignite combusted at a power plant in North Dakota can vary by as much as a factor of 4 or more in a given year. Short-term sulfur dioxide emission rates can vary by the same factor."[15] If the highest-sulfur lignite coal burned in the baseline period is used to establish maximum short-term emission rates during the baseline period, those rates may be higher than current maximum short-term rates because of current practices at some facilities that include blending higher-sulfur lignite with lower-sulfur lignite or with sub-bituminous coal shipped in by rail to comply with Title IV requirements.

These problems of establishing accurate and reliable maximum short-term baseline emissions are among the reasons this approach is not practical in North Dakota, and show why EPA is wise in the proposed language for (f)(1)(iii) to allow use of the Puzzlebook maximum short-term emissions approach to calculating increment consumption only when the following criteria can be satisfied:

> <u>The reviewing authority may use an actual maximum rate over a 24-month period when sufficient data are available to produce a consistent, reliable, and representative analysis of the change in emissions from baseline to the current time period.</u>

EPA may wish to add the language from page C.49 of the Puzzlebook (quoted on page 16 above) to (f)(1)(iii) so that there is no ambiguity about what this underlined language in (f)(1)(iii) is referring to. Some states and environmental groups seem to overlook these difficult problems with using current maximum emission rates by ignoring the problem of establishing consistent, reliable, and representative analyses of short-term maximum baseline emissions based on changes such as the type of coal that is burned and how it is blended differently than during the baseline period in relevant baseline facilities. Reconstructing such data would be extremely challenging, if not impossible, in North Dakota. States where baseline facilities have switched from burning high-sulfur bituminous

[15] *See, e.g.,* Docket Exhibit 83, "Prevention of Significant Deterioration Sulfur Dioxide Final Baseline Emission Rates" (May 2003), page 35.

coal to low-sulfur western sub-bituminous coal are additional examples of where this issue may arise.

b. Example 2: Problems in North Dakota with establishing "the <u>maximum</u> short-term actual emissions rates for the 3-hour and 24-hour increments as of the minor source baseline date" under the Puzzlebook approach for minor sources with high short-term emissions for short periods of time during the baseline period.

When NDDOH was investigating baseline emission rates for minor-source oil wells within 50 kilometers of its Class I areas that were drilled and became operational during the minor-source baseline-date period, records revealed flaring of large amounts of natural gas from some of those wells for short periods of time (days and weeks) after the wells became operational, then lesser amounts of natural gas were flared from those sources after that initial pressure was released. Most of these wells have since been retired or have their collected for use in natural gas processing facilities since the baseline period. But if the Puzzlebook's approach were used, a maximum short-term emission rate from these wells might have created unreasonably high short-term temporary emission rates if data on the sulfur content of the flared gas were available, because, under the Puzzlebook approach, the highest 3-hour and 24-hour emission rates from these flared wells would serve as the measure of short-term emissions over the entire two-year baseline period, even though those high emissions only occurred over a short period of time in that two-year period. This is a second example of why EPA is wise in the proposed language for (f)(1)(iii) to allow use of the Puzzlebook maximum short-term emissions approach to calculating increment consumption only when data are available that allow the reviewing authority to establish a consistent, reliable, and representative analysis of the change in emissions. In the case of the flared wells, the short, high-emission periods were not consistent, reliable, or representative. The last sentence of proposed (f)(1)(iii) is needed to make this legal standard clear.

3. A "Gulf Coast" problem and a "paper offsets" problem may exist when allowable emissions are used to establish

baseline and increment consuming emission levels in PSD review.

NDDOH's August 6th comments, at pages 18-22, describe the "paper offset" and "Gulf Coast" issues. That discussion will not be repeated here. Attachments D and E help illustrate this issue. The emissions in the left hand column represent the total permit-allowable emissions from all major sources if they operate at their maximum capacity 24 hours per day, 365 days per year—which in this case is 275,807 tons of the regulated pollutant. The "Paper Offsets" problem is that the baseline sources, which the right hand column shows are currently emitting 84,623 tons, can increase their emissions all the way up to 178,408 tons per year—which is their maximum allowable permit capacity—without consuming any increment. This would allow just the baseline sources to emit more pollution—178,408 tons—than the current combined emissions from both the sources that were operating at the minor source baseline date (the baseline sources) and those that were built afterwards (increment consuming sources with no baseline emissions), which the right hand column on Attachment D show to be 140,905 tons.

But if the regulatory authority establishes an actual emissions baseline in the manner contemplated by the 1980 preamble, "Baseline Concentration, Baseline Area, and Baseline Date," 45 Fed. Reg. 52,675, 52,713-715 (August 7, 1980), and determines the baseline source's actual "normal source operations" emissions as defined by rule and explained in the 1980 preamble, then the baseline sources become increment consumers when their emissions exceed their normal source operations baseline emissions, which in the example in Attachment D turned out to be 103,641.8 tons. Further, the 103,641.8 tons is representative of the actual emissions that were going into the air and affecting air quality during the baseline period, so this emission level satisfies the requirement that the "baseline concentration" be representative of "the ambient concentration levels which exist at the time of the first application for a permit in an area subject to this part" under Clean Air Act (CAA) § 169(4), 42 U.S.C. § 7479(4). Allowing these baseline sources to emit all the way up to their maximum permit allowable levels would allow the baseline sources to emit 178, 408 tons per year, when they were not emitting at those levels during the baseline period. They get the "paper offset" from their permit, when in

fact their emission levels and their affect on air quality at the baseline date were not that high.

The "Gulf Coast" problem is represented by the same facts in Attachment E, but the focus of the "Gulf Coast" problem is on increment consuming emissions, rather than baseline emissions. The "Gulf Coast" problem is really the same issue as the "paper offsets" problem, but in a different context. The "Gulf Coast" problem occurs when "allowable" emissions are significantly higher than actual emissions, thus distorting either the increment consuming or baseline concentration calculations by using numbers unrepresentative of actual conditions in calculating compliance with the PSD increments.

Attachment E is an example of the difference that can exist between allowable and actual emissions. In this example, when allowable emissions are used to calculate increment consumption, the increment consuming sources are modeled as if they are operating at their maximum permit capacity 24 hours per day, 365 days per year. In this case, they are modeled as if they are emitting 97,399 tons per year, when in fact those sources have only emitted 56,282 tons into the air, or 57.8% of the allowable emissions that are used in the increment compliance modeling to determine whether they are in compliance with the increments. This "non-representative emissions" problem was labeled the "Gulf Coast" problem in the 1980 preamble, after the case where this problem was first identified, where it was described as "a theoretical increment violation in a clean area, unrelated to actual air quality impact."[16]

4. The PSD provisions of the Act require that monitoring be used to assess air quality in PSD review, and allows monitoring to be used to adjust model predictions when models over-predict or under-predict increment consumption when compared to actual ambient concentrations.

Several comments have raised the issue that using "average rate" emissions will under-predict short-term increment consumption. One of the ways of addressing this issue is through the use of monitoring as provided

[16] *See*, 45 Fed. Reg. at 52,681, 52,717-721(discussion of "Gulf Coast case on 52,720-721).

in the Act. As discussed in our August 6th comments, EPA-HQ-OAR-2006-0888-0590.1, pages 48-50, Congress required checking model outputs and accuracy by requiring monitoring under CAA § 169(e) to make sure modeling was providing a realistic projection of air quality. The Alabama Power I decision made clear that monitoring must be included in the increment analysis to determine whether an increment violation is occurring:

> 2. Required Uses of Monitoring Data
>
> Subsection 165(e)(2) provides in part:
>
> > Effective one year after date of enactment of this part, the analysis required by this subsection shall include continuous air quality monitoring data gathered for purposes of determining whether emissions from such facility will exceed the maximum allowable increases or the maximum allowable concentration permitted under this part.
>
> This is a requirement for use of monitoring data to determine actual or potential violation of the allowable increments. EPA's regulations have required monitoring only to determine whether an applicable NAAQS will be exceeded. Again, the regulation falls short of statutory command.
>
> EPA argues in justification for its restrictions both on the use of monitoring and on the number of pollutants covered that monitoring for actual air quality concentrations is technologically infeasible for all but a small number of pollutants and that current monitoring techniques are at best of questionable accuracy even for the relatively straight-forward measurement of whether an applicable NAAQS has been exceeded.
>
> We discern from the statute a technology-forcing objective. Congress intended that monitoring would impose a certain discipline on the use of modeling techniques, which would be the principal device relied upon for the projection of the impact on air quality of emissions from a regulated source. Unless the employment of modeling techniques can be held to earth by a

> continual process of confirmation and reassessment, their use would inspire little confidence as a means for realistic projection of air quality. This objective is furthered by the development of sophisticated monitoring techniques, and the collection of the data base that would result from monitoring's widespread use. Of course even a congressional mandate, such as a technology-forcing requirement based on a congressional projection of emergence of technology for the future, is subject to a justified excuse from compliance where good-faith effort to comply has not been fruitful of results. That is far different from the exemption created by EPA on the basis of current technological infeasibility.

Alabama Power I, 606 F.2d 1068, 1087 (D.C. Cir. 1979).

In response to Alabama Power I's requirement that monitoring must be used "to determine actual or potential violation of the allowable increments,"[17] EPA promulgated monitoring requirements in the PSD rules, the substance of which have not been altered since they were promulgated. Compare the 1979 proposed monitoring rule at 44 Fed. Reg. 51,924, 51,950 (September 5, 1979) to the current monitoring rule, which provides:

> (m) Air Quality Analysis.
>
> (1) Preapplication analysis.
>
> (i) The plan shall provide that any application for a permit under regulations approved pursuant to this section shall contain an analysis of ambient air quality in the area that the major stationary source or major modification would affect for each of the following pollutants:
>
> (a) For the source, each pollutant that it would have the potential to emit in a significant amount;
>
> (b) For the modification, each pollutant for which it would result in a significant net emissions increase.

[17] 606 F.2d at 1087.

(ii) The plan shall provide that, with respect to any such pollutant for which no National Ambient Air Quality Standard exists, the analysis shall contain such air quality **monitoring** data as the reviewing authority determines is necessary to assess ambient air quality for that pollutant in any area that the emissions of that pollutant would affect.

(iii) The plan shall provide that with respect to any such pollutant (other than nonmethane VOCs) for which such a standard does exist, the analysis shall contain continuous air quality **monitoring** data gathered for purposes of determining whether emissions of that pollutant would cause or contribute to a violation of the standard or any maximum allowable increase.

(iv) The plan shall provide that, in general, the continuous air **monitoring** data that is required shall have been gathered over a period of one year and shall represent the year preceding receipt of the application, except that, if the reviewing authority determines that a complete and adequate analysis can be accomplished with **monitoring** data gathered over a period shorter than one year (but not to be less than four months), the data that is required shall have been gathered over at least that shorter period.

(v) The plan may provide that the owner or operator of a proposed major stationary source or major modification of volatile organic compounds who satisfies all conditions of 40 CFR Part 51 Appendix S, section IV may provide postapproval **monitoring** data for ozone in lieu of providing preconstruction data as required under paragraph (m)(1) of this section.

(2) Post-construction **monitoring.** The plan shall provide that the owner or operator of a major stationary source or major modification shall, after construction of the stationary source or modification, conduct such ambient **monitoring** as the reviewing authority determines is necessary to determine the effect emissions from the stationary source or modification may have, or are having, on air quality in any area.

> (3) Operation of **monitoring** stations. The plan shall provide that the owner or operator of a major stationary source or major modification shall meet the requirements of Appendix B to Part 58 of this chapter during the operation of **monitoring** stations for purposes of satisfying paragraph (m) of this section.

40 C.F.R. § 51.166(m). (Emphasis supplied.)

The preamble to the proposed 1979 PSD rules explains the role monitoring is to play in PSD increment compliance analysis:

> EPA agrees that monitored ambient data is valuable for such purposes as validating and refining models and, in some cases, providing a direct measure of increment consumption. In accordance with the court's opinion, EPA plans to place a greater emphasis on the development and use of monitoring data.
>
> However, use of monitoring data will always be limited to some degree. First, air quality impacts of a proposed source must necessarily be based on modeling, not monitoring. Second, several actual emission changes that would be detected by an ambient monitor are not considered to consume increment. For example, emissions from any source commencing construction prior to January 6, 1975, but completed at some later date, do not count against increments. Third, a state may exempt certain emission changes which otherwise would be counted against increment. Potential exemptions include federally ordered fuel switches, temporary emissions, and new sources outside the United States. Finally, with limited exceptions, section 123 prohibits a source from receiving credit for the dispersive effects of a stack height which exceeds good engineering practice. Consequently, if a source's emissions are counted against increment and its stack height exceeds good engineering practice, its emissions must be calculated as though emitted from a good engineering practice height. A monitor will reflect air quality impacts based on actual stack height.

> In view of these limitations, EPA believes that, for the present, monitoring data will be most productive in checking the accuracy of models. To some extent, monitoring data may be used to measure increment consumption, particularly in cases where there are few or no other sources in the area of a proposed new source or modification, or where all sources located in the area of concern have emissions which count against the increment. In any case, where an applicant or other party believes that a model required by EPA has either over-predicted or under-predicted the air quality impact of a source, monitoring data will be evaluated to the extent possible to determine whether modeling adjustments are necessary.
>
> Over time, the development of more sophisticated monitoring techniques may permit increased use of monitoring data to track increment consumption and establish ambient baselines, as well as improve the level of confidence in modeling.

44 Fed. Reg. at 944. (Emphasis supplied.)

No case has tested whether the mandatory "shall" in CAA § 165(e)(2)—of which Alabama Power I stated: "This is a requirement for use of monitoring data to determine actual or potential violation of the allowable increments"[18]—is satisfied by the weaker implied "may" adopted in 40 C.F.R. § 51.166(m) and the language in the preamble stating EPA's intent at 44 Fed. Reg. at 944 quoted above. The Alabama Power II court softened its language on the extent that monitoring must be used to track increment compliance, apparently in recognition that monitoring and modeling technologies were not then advanced enough to measure the increments accurately through monitoring, but it did not back off on its position that monitoring must be included as part of the increment consumption analysis:

> Of course even a congressional mandate, such as a technology-forcing requirement based on a congressional projection of emergence of technology for the future, is subject to a justified excuse from compliance where good-faith effort to

[18] 606 F.2d at 1087.

> comply has not been fruitful of results. That is far different from the exemption created by EPA on the basis of current technological infeasibility. Though EPA has authority to require methods other than monitoring in its effort to ensure that allowable increments and NAAQS are not violated, and though it may choose to invoke that authority because of its perception that monitoring alone is inadequate to the task, it does not have authority to dispense with monitoring as at least one element of the overall enforcement effort where Congress has mandated the use of that technique.

Alabama Power II, 636 F.2d at 372.

The 1980 preamble dodged the issue of whether monitoring must be included as part of the analysis by quoting part of the Alabama Power II interpreting CAA § 169(e)(1), not CAA § 169(e)(2), which addressed the separate issue of whether monitoring was "*the* method" (as in, the only method) by which increment compliance may be determined. On that issue, the Alabama Power II court held either modeling or monitoring may be used as the method of analysis for determining compliance with the increment as noted in the preamble at 44 Fed. Reg. at 52,724. But no subsequent case has addressed whether the mandatory "shall" in CAA § 169(e)(2) requires that monitoring be included "as at least one element of the overall enforcement effort" when doing increment compliance assessments, as the above language from Alabama Power II, 636 F.2d at 372, holds.

Notwithstanding that unresolved issue, the language from the preamble to the monitoring rule EPA promulgated in 1979, currently 40 C.F.R. § 51.166(m), shows that EPA intended when it promulgated that rule that "monitoring data" would be used in "checking the accuracy of models."[19] Further, "[i]In any case, where an applicant or other party believes that a model required by EPA has either over-predicted or under-predicted the air quality impact of a source, monitoring data will be evaluated to the extent possible to determine whether modeling adjustments are necessary." Thus, it is clear that monitoring serves at least these two functions in increment compliance analyses:

[19] 44 Fed. Reg. at 944.

- Monitoring may be used to check the accuracy of models; and
- When monitoring shows that either a model has over-predicted or under-predicted the air quality impact of a source, "modeling adjustments" may be necessary.

These uses of monitoring data are consistent with (though perhaps not adequate to) the requirements of CAA § 169(e)(2) or 40 C.F.R. § 51.166(m)(1)(b)(iii) quoted above, which also uses mandatory "shall" language:

> (iii) The plan shall provide that with respect to any such pollutant (other than nonmethane VOCs) for which such a standard does exist, the analysis shall contain continuous air quality **monitoring** data gathered for purposes of determining whether emissions of that pollutant would cause or contribute to a violation of the standard or any maximum allowable increase.

When NDDOH conducted draft modeling in 1999 that showed potential violations of the 24-hour SO2 increment using allowable emission rates, it was apparent that the model was over-predicting increment consumption when compared to the highest emission rates. NDDOH's August 6th comments summarized what occurred as follows:

> Available actual ambient sulfur dioxide concentrations illustrated that modeling by the Department in 1999 and by EPA Region 8 in 2002-03 produced absurd estimates of CAA PSD sulfur dioxide short-term increment consumption, since those estimates were about double the actual concentrations. So the technology of Calmet and Calpuff modeling alone was inadequate to resolve for air quality management whether cumulative increment consumption exceeded the short-term increments (see, for example, paragraphs S3, S4, S5 and S6 on pages xi through xx and sections 5.12, 6.8 and 8.8 in *Responses to Recurring Issues*).

EPA-HQ-OAR-2006-0888-0590.2, p. 22.

As noted, when it became apparent that the issues could not be resolved by using the more current approved models than NDDOH initially used, the issue shifted to what emission rate should be used to more accurately predict short-term 24-hour increment consumption. NDDOH contended that "average rate" emissions as defined by 40 C.F.R. § 51.166(b)(21(ii) and its equivalent state rule under North Dakota's SIP should be used, because it was the other alternative to allowable emissions provided in the relevant rule. Region 8 chose 90th percentile emissions, even though that is not an option defined by rule (or guidance). NDDOH initiated a periodic review that addressed these issues, and used monitoring for the purposes described in Alabama Power I, Alabama Power II, and 44 Fed. Reg. at 944 to determine (among many other issues that were raised) whether its modeling using "average rate" emissions was over-predicting or under-predicting 24-hour increment consumption. When it was determined that "average rate emissions" were not under-predicting concentrations of SO2 in North Dakota's Class I areas (based on modeling a full emissions inventory so that model predictions could be compared to monitored concentrations), NDDOH determined that air quality related values were being protected n North Dakota's Class I areas, and that the 24-hour increments were not being violated.

Environmental groups, some of which participated in NDDOH's periodic review, are now setting forth NDDOH's initial 1999 modeling as an objection to the rule clarifications proposed in this rulemaking. See, *e.g.,* EPA-HQ-OAR-2006-0888-0607.10. Rather than disprove the need to make the clarifications EPA makes to the definition of "actual emissions" and how is to be used in calculating short-term increment consumption, those objections illustrate the need to clarify the options states and other reviewing authorities have in calculating short-term emissions and how they are to be calculated as EPA has done in this rulemaking. But their objections illustrate why EPA should consider adding another subsection to (f)(1) to further clarify beyond the guidance provided by Alabama Power I, Alabama Power II, 44 Fed. Reg. at 944, CAA § 165(e)(2), and 40 C.F.R. § 51.166(m) concerning what "modeling adjustments" may be made when it becomes apparent that a model is either over-predicting or under-predicting increment consumption.

Environmental groups cite an under-prediction in a Utah PSD increment compliance analysis as evidence that "average rate" emissions

cannot be used to predict short-term increment consumption. But as noted in the preamble at 44 Fed. Reg. at 944 above, "modeling adjustments" may be used when models either over-predict or under-predict increment consumption. The fact that an average-rate emissions sometimes will under-predict short-term increment consumption does not mean that a highest emission rate must be chosen that over-predicts increment consumption more than average-rate emissions may be under-predicting increment consumption.

NDDOH makes the following suggestions about how (f)(1)(iii) might be amended to address this problem:

- First, the rule should state how accurate the monitoring must be, and at what levels of over-prediction or under-prediction "modeling adjustments" may be made. NDDOH suggests that an over-prediction or under-prediction of less than 50 percent of any of the Class I increments, or less than 25 percent of the Class II or Class III increments as a possible "permissible margin or error" that would trigger a possible review of model predictions when identified by the reviewing authority in an NSR permit review or PSD periodic review when it is exceeded.
- Second, if it turns out that a maximum rate is over-predicting increment consumption, and an "average rate" emission is under-predicting increment consumption, then the rule should identify what "modeling adjustments" may be allowed to more accurately assess increment consumption. The NDDOH's periodic review suggests at least three options:
    - Use of hourly CEMS data;
    - Adjustment of percentile of emissions for calculating short-term or annual increment consumption used above "average rate" emissions based on the percentile of emissions that most accurately estimates the highest ambient concentrations in the area at issue based on comparison with a sample size of the highest monitored and modeled ambient concentrations large enough to draw statistically valid conclusions. NDDOH suggests comparing the highest 25 concentrations. An example of how this would work is illustrated in NDDOH's periodic review. NDDOH modeled "average rate" emissions,

which in our case turned out to be 74th percentile emissions. Region 8 modeled 90th percentile emissions, which turned out to still significantly over-predict increment consumption in North Dakota's Class I areas. *See Response to Recurring Issues,* Table 14, p. 113, EPA-HQ-OAR-2006-0888-0590.7. Nor would the appropriate percentile emission rate be that difficult to identify after one or two modeling runs. For example, a statistician could look at the data distribution table on page 18 of Attachment A, which shows a combined emissions data distribution of all major sources following a bell curve and make a reasonable estimate of the appropriate percentile rate based on how much the percentile rate already modeled either over- or under-predicts the highest concentrations based on a statistical analysis and comparison with monitoring data.

- A third option would be to make a bias adjustment in the predictions made by the model based on a mean-normalized bias adjustment as described in *Response to Recurring Issues,* Section 5.6, pp. 59-60, EPA-HQ-OAR-2006-0888-0590.7.

In addition, if EPA adds such a subsection to proposed rule (f)(1), it should be made clear that monitoring data is the tool that is required to be used to make the "appropriate adjustments." When a disagreement develops concerning the appropriate emission rate or monitoring adjustment, monitoring data should control which "modeling adjustment" is most statistically valid and scientifically accurate in the manner required by CAA § 165(e)(2) and the basic Daubert criteria that apply to the admissibility of scientific data and conclusions in contested administrative and court proceedings: that they are "'capable of empirical test;'"[20] and that they are falsifiable, refutable, or testable.[21]

III. States have used the many different options provided in the definition of "actual emissions" in determining the appropriate emission rate to use in calculating increment consumption. The proposed rule brings clarity to how these

[20] Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, 593 (1993)(citations omitted).
[21] Id.

options may be exercised, but flexibility is a good thing not a bad thing, because air quality preservation issues are different in each state and region.

Comments filed by environmental groups contend that the maximum emission approach set forth in the DRAFT *New Source Review Workshop Manual* (October 1990), p. C.49, to calculate short-term increment consumption has been widely used in doing NSR and PSD increment assessments. One of the things revealed in the Questionnaire Summary: Regional/State/Local Modeler's Workshop, New Orleans, May 16, 2005, EPA-HQ-OAR-2006-0888-0587.4 (*See* "Q16. How Does The State Quantify Short Term Actual Emission Increases From Existing Sources?") is that different states and regions have exercised each of the options provided in the rule for calculating short-term actual emissions increases. This is to be expected, given that the "actual emissions" definition allows these different options. And some use the Puzzlebook maximum approach, although the survey doesn't reveal how they use it for baseline sources (i.e., whether they subtract maximum short-term baseline emissions from current maximum short-term emissions). In states that do not have Class I areas, or are not in danger of violating any of the various Class I or Class II increments, an allowable or maximum emission approach may be more appropriate. In other areas, for example areas were sources are emitting at levels considerably below their permit-maximum levels, the more labor intensive and fact-intensive tracking of actual emission changes may be the more appropriate regulatory choice. The survey does not include an analysis of the reasons that states are making these different regulatory choices.

IV. The PSD provisions of the Act give states flexibility, and Congress intended states to have flexibility, in managing the PSD increments.

Some comments filed in this rulemaking suggest that the PSD increments are alternative national ambient air quality standards (NAAQS) that apply in PSD areas that are in compliance with the NAAQS, and claim "Congressional history" supports this position, and use that basis for their argument that the Class I increments, and the variance provisions in CAA § 165, must be strictly construed. *See, e.g.,* EPA-HQ-OAR-2006-0888-0614, page 24. In support of this, entities rely almost entirely on the House Bill

portion of the legislative history for the 1977 CAA amendments. Although the House Bill prevailed on many of the non-PSD aspects of the 1977 CAA amendments, the Senate Bill prevailed on most of the PSD issues relevant to this rulemaking—Class I increments, the primacy and use of the air quality related values test, the Class I variances,[22] and heightened flexibility and discretion of States. This is reflected in the House Conference Report No. 95-564 (August 3, 1977), the portions of which referred to the PSD provisions of the Act are attached to these comments as Attachment B, and Senate Report No. 95-127 (May 10, 1977), the portions of which referred to the PSD provisions of the Act are attached to these comments as Attachment C.

The House Conference Report No. 95-564, at 151-52, makes clear that the Senate Bill version was used for the Class I increments:

> The specific increments are set forth in the statute as in the Senate bill, as follows: (a) class I, Senate bill; (b) class II, House bill except the 3 hour SO^2 increment, which becomes 512 micrograms per cubic meter; (c) class III, House bill except the 3 hour SO^2, which becomes 700 micrograms per cubic meter. Increments may not be exceeded more than once per year, except as provided in Sec. 165, which provides for variance from class I increments in Federal mandatory class I areas.
>
> The listing of lands to be included in mandatory class I areas is as in the Senate bill.

[22] The House Conference Report No. 95-564 (August 3, 1977) is unclear on this point. The 1977 Bill's House Report No. 95-294 (May 12, 1977), p. 7, correctly notes that the 1977 House Bill took out the Class I variances that had been in the 1976 House Bill. But the House Conference Report No. 95-564, at 149 refers to the 1976 House Class I variance provision left out of the original 1977 House Bill that would allow up to 18 exceedences per year and required that the Class II increment (which the House Bill defined as ¼ or 25% of the NAAQS standard). House Conference Report No. 95-564, page 153 states:

> The conference adopted a modified version of the House provision which allows a variance to be granted from the nondegredation increments for up to 18 days a year. The variance would be available only for the sulfur dioxide 3 hours and 24 hour class I increments. The variance would allow class I increments to be exceeded on a total of 18 days per year. A violation of 3 hours in one day is considered a violation for the entire day. High terrain areas are defined as terrain 900 feet above the stack of the facility applying for the waiver.

When the final language adopted in the Act relating to the variances, CAA § 165(d), 42 U.S.C. § 7475(d) is compared to the various versions of the Bill, the variance provisions appear to be primarily drawn from the 1976 House Bill and the 1977 Senate Bill.

Further the House Conference Report No. 95-564, at 150, describes how the Class I variances are to work, as taken from the Senate Bill:

> Any Federal land manager or supervisor of an affected class I area, or the administrator of EPA, or a Governor of an adjacent State, is authorized to notify the State of potential adverse impact on the air quality within the class I area with a statement identifying potential impacts from the proposed facility. If no such notice is forthcoming, the applicant is required only to meet best available control technology requirements as statutorily defined and show that the class II increment will not be exceeded.
>
> If there is such notice, the applicant would be required to demonstrate whether the class I increments would be exceeded in the class I areas, and—
>
> > If the permit applicant meets the class I increments, but the Federal land manager (not the supervisor) demonstrates to the satisfaction of the State that the applicant's emissions would nevertheless have an adverse effect on the air quality-related values of the Federal lands, the State must deny the permit; or
> >
> > If the permit applicant does not meet the class I increments but demonstrates, to the satisfaction of the Federal land manager (not the supervisor), that there would be no adverse impact on the air quality-related values of the Federal lands, the State may issue the permit.
>
> In the event a dispute occurs over any development or activity in an adjacent State, the Governor of the affected State may request the Administrator to enter into negotiations. If this is not successful, the Administrator shall then resolve the dispute.
>
> The Senate concurs in the House regulatory provision with the addition of a provision that the grant of authority in the Conference substitute to the Environmental Protection Agency to regulate substances that may reasonably be anticipated to endanger the public health or welfare because of their effect on the stratosphere is not intended to supersede or preempt

> authority that other agencies may have under existing law to take regulatory action with respect to the same or similar hazards presented by products or activities subject to their jurisdiction.

The last paragraph of discussion of the Senate Amendment included in House Conference Report No. 95-564, at 151, appears to allow the EPA administrator to seek injunctive relief only when the Class II increment is violated:

> In the event that the emissions from any new major emitting facility will cause or contribute to a pollutant increase greater than a class II increment for such pollutant, the Administrator shall, and a Governor may, seek injunctive relief to prevent the issuance of a permit or construction of that facility.[23]

The Senate Report makes clear that the law builds considerable judgment and flexibility for states to exercise under the Act in implementing and interpreting the national policy on a case-by-case and site-specific basis:

> This policy will be implemented by the States. Judgments will be made on a case-by-case basis, taking into account local factors. But in no case will deterioration be permitted to a level that would exceed any national ambient air quality standard.
>
> The Administrator's role is one of monitoring State actions. … But the Administrator could not and should not attempt to burden this section with unnecessary regulations and guidelines.

Senate Report No. 95-127, at 11-12.

> During hearings in 1974 and 1975 the committee was urged to clarify and resolve this [PSD] issue through legislation, rather than leaving the matter to the courts. This section provides the statutory substance to the more general language in section 101(b) of the act, which articulates the concept of the

[23] Whether this refers to alternative Class I increment that applies only to a specific source to which the variance is given (which was the SO2 Class II increment under the House Bill), the Class II increment in CAA § 163(b)(2), or both, is unclear.

prevention of significant deterioration. The committee intends in this new subsection 110(g) to completely define the requirements of the Clean Air Act to prevent significant deterioration. This section protects clean air areas from deteriorating while permitting the economic development necessary to achieve a steady improvement in our standard of living.

Senate Report No. 95-127, at 29.

The decision regarding the actual implementation of best available technology is a key one, and the committee places this responsibility with the State, to be determined in a case-by-case judgment. It is recognized that the phrase has broad flexibility in how it should and can be interpreted, depending on site.

In making this key decision on the technology to be used, the State is to take into account energy, environmental, and economic impacts and other costs of the application of best available control technology. The weight assigned to such factors is to be determined by the State. Such a flexible approach allows the adoption of improvements in technology to become widespread far more rapidly than would occur with a uniform Federal standard. The only Federal guidelines are the EPA new source performance and hazardous emissions standards, which represent a floor for the State's decision.

This directive enables the State to consider the size of the plant, in the increment of air quality which will be absorbed by any particular major emitting facility, and such other considerations as anticipated and desired economic growth for the area. This allows the States and local communities to judge how much of the defined increment of significant deterioration will be devoted to any major emitting facility. If, under the design which a major facility propose, the percentage of the increment would effectively prevent growth after the proposed major facility was completed, the State or community could refuse to permit construction, or limit its size. This is strictly a state and local decision; this legislation provides the parameters for that decision.

….

Similarly, when an analysis of energy, economics, or environmental considerations indicates that the impact of a major facility could alter the character of that community, then the State could, after considering those impacts, reject the application or condition it within the desires of the State or local community. Flexibility and State judgment are the foundations of this policy.

The chief tool to be used in implementing the no-significant deterioration requirements is the permit that must be issued by the State for any major emitting facility to be located in any clean-air area, including Federal lands. The permit must include an emission limitation based on best available technology. It must insure that total emissions from the facility are such that the increments will never be exceeded. The application for a permit must include careful analyses of climate and meteorology, the soils, the vegetation, the visibility, and other environmental factors at the proposed site and in the area that might be affected by the emissions.

Senate Report No. 95-127, at 31-32.

Much confusion has occurred regarding the buffer zones that supposedly encircle these class I areas. The committee has eliminated any buffer zones by setting the class I increment as a flexible test. The class I increment is a test for determining where the burden of proof lies and is an index of changes in air quality. It is not the final determinant for approval or disapproval of the permit application.

….

When notice is filed, the applicant must demonstrate whether or not the class I increments would be exceeded in the class I areas. If they are met, but the Federal land manager, not the supervisor, nevertheless can demonstrate to the satisfaction of the State that the emissions would still have an unacceptable adverse effect on the air quality-related values of the class I Federal lands, then the State must refuse to issue a permit.

If, on the other hand, the permit applicant demonstrates, to the satisfaction of the Federal land manager, that there would be no unacceptable, adverse impact on the air quality related values of the class I Federal lands, notwithstanding the fact that the class I increments would be exceeded, the State may issue the permit.

Each case of suspected class I intrusion must be analyzed on an individual basis, with the decision on whether or not a permit is issued resting with the State. The Federal land manager holds a powerful tool. He is required to protect Federal lands from deterioration of an established value, even when class I numbers are not exceeded. And whenever they are, he must be satisfied by the applicant that the air quality values of Federal lands will not be impaired, and certify to that effect before the State may issue a permit.

No land use plan is required under the requirements to prevent significant deterioration. States will comply by amending their existing Clean Air Act implementation plan. If a State fails to adopt such an amendment, no major emitting facility can be constructed in the areas of the State identified as cleaner than any existing standards. The Federal Government's role under the provision to prevent significant deterioration is far less extensive than under provisions required to achieve the primary and secondary standards under the Clean Air Act.

The committee intends a sharply restricted role for the Environmental Protection Agency in regard to implementing the policy to prevent significant deterioration. EPA is limited to (1) approving the new source review process established by the State; (2) seeking injunctive relief or other measures that would be necessary to prevent the issuing of a permit for a new source if it does not comply with the requirements of the subsection; (3) resolving interstate disputes; and (4) notifying a State when it believes adverse impact may occur in a class I area. Once the State submits an adequate amendment to its plan, the Environmental Protection Agency role is restricted to assuring compliance with the law.

Senate Report No. 95-127, at 35-36.

Nowhere is there any indication in either the language of the Act or its legislative history that a source that gets a variance must get offsets.

The flexibility and judgment that states may exercise was incorporated into the PSD provisions of the Act. Congress gave states authority to do the following:

- Designate[24] (and re-designate when appropriate)[25] the size and location of the various PSD air quality management regions or areas within its borders;

- Re-designate PSD air quality management regions from Class II to Class III, when a state determines that it wants to allow more deterioration in an air quality management region than allowed by Congress' original Class II designation, or redesignate PSD air quality management regions from Class II to Class I, when a state determines that it wants to allow less deterioration in an air quality management region than allowed by Congress' original Class II designation;[26]

- Consider major source preconstruction applications, make permitting decisions, and determine the best available control technology (BACT) for new major emitting facilities and existing facilities undergoing major modifications;[27]

- Establish the baseline concentration by monitoring ambient concentration levels, and by making adjustments to the monitored baseline ambient concentration levels with computer modeling, after taking into account projected emissions from a source that had commenced construction but not begun operation by January 6, 1975, as well as actual emissions after the baseline date if a source can demonstrate that its operation after the baseline date is more representative of normal source operation than its operation preceding the baseline date;[28] and

[24] CAA §§ 107 & 161, 42 U.S.C. §§ 7407 & 7471.
[25] CAA § 164(a); 42 U.S.C. § 7474(a).
[26] CAA § 164(a); 42 U.S.C. § 7474(a).
[27] CAA § 169(1)-(3), 42 U.S.C. §7479(1)-(3).
[28] N.D. Admin. Code § 33-15-15-01(a)(1); 40 C.F.R. § 51.166(b)(21)(ii); 40 C.F.R. § 52.21(b)(21)(ii); 45 Fed. Reg. 52675, 52714 (August 7, 1980); *Alabama Power Co. v. Costle*, 636 F.2d 323, 372, 381, 387 (D.C. Cir. 1979); EPA's *Prevention of Significant Deterioration Workshop Manual* (October 1980).

- Participate in proceedings that make adjustments in application of the Class I increments in mandatory Class I areas based on air quality related values after scientific studies are done, public hearings are held, and determinations are made by the state's governor and the federal land manager, or, if they cannot agree, by the president.[29]

In summary, the PSD provisions of the Act give states considerable discretion, judgment, and flexibility. EPA's proposed rules in this rulemaking are consistent with this by allowing states to make factual and technical judgments on a case-by-case basis.[30]

V. The NDDOH's letter dated April 14, 2000, to Minnkota was not definitive in construction of emissions inventories for modeling PSD class I increment consumption.

The environmental groups submitted docket document EPA-HQ-OAR-2006-0888-0930.1, which is a letter dated April 14, 2000, by the NDDOH to Minnkota Power Cooperative, Inc. This letter indicates that the modeling conducted at that time relating to proposed emissions increases would cause violations of the PSD class I increments for sulfur dioxide.

[29] Clean Air Act § 165(d)(2)(C) & (D), 42 U.S.C. § 7475(d)(2)(C) § (D). Craig N. Oren, "The Protection of Parklands from Air Pollution: A Look at Current Policy," 13 Harv. Envt'l Law Rev. 313, 374-81 (1989), discusses the legislative history relating to this provision in some detail, and concludes, *Id at 381*, that "[W]hile the Federal Land Manager has the affirmative responsibility to protect air quality related values, 'the final decision still rests with the State.'" Although the final version of the bill gave the president authority to override the air quality-related value determination of the state's governor, between the federal land manager and the governor, the governor retained the final say in determining air quality-related values as shown by Oren's discussion of this provision's legislative history. Id. at 374-81; CAA § 165(d)(2)(D)(i) &(ii), 42 U.S.C. § 7475(d)(2)(D)(i) &(ii).

[30] The discussion of the "health basis" for the increment in House Conference Report No. 95-564, at 105-141, cited by environmental groups in their comments appear to be primarily directed to concerns about whether the primary and secondary NAAQS had been set at an appropriate level, and are addressed primarily to allowing additional deterioration in the Class II areas up to levels close to the NAAQS that may pose health and welfare problems. That the Conference Committee actually increased the House version of the Class II SO2 increments to levels higher than ¼ or 25% of the NAAQS suggests that the majority of Congress did not agree with this provision. *See* House Conference Report No. 95-564, at 151 ("The specific increments are set forth in the statute as in the Senate bill, as follows: (a) class I, Senate bill; (b) class II, House bill except the 3 hour SO^2 increment, which becomes 512 micrograms per cubic meter; (c) class III, House bill except the 3 hour SO^2, which becomes 700 micrograms per cubic meter."). The concerns about the about the appropriate levels of the NAAQS are of less significance in areas considerably below the NAAQS. EPA-HQ-OAR-2006-0888-0011.6. The AQRV test in CAA § 165 allows any environmental impacts on Class I areas to be considered at levels either above and below the increments.

Modeled violations of the class I sulfur dioxide increments had occurred in prior Class I increment modeling assessments since 1978.[31]

Facts omitted by the environmental groups that preceded and followed NDDOH's April 14, 2000 letter and put it in context include:

1) NDDOH submitted a draft *Calpuff Class I Area Analysis for [the] Milton R. Young Generating Station*[32] to EPA Region 8 under a cover letter dated October 21, 1999 (Attachment F to this letter). This letter, which has not previously been included in dockets for proceedings, states: "The attached draft report describes the Class I area analysis conducted by the NDDH. Minnkota, with the assistance of a consultant (ENSR), is currently reviewing the report. … In addition, we would appreciate receiving any comments you may have regarding the methodology described in the draft report. A final report will be prepared based on comments received from the EPA Region 8, National Park Service, and Minnkota." The NDDOH did not prepare a final Minnkota report.

2) EPA Region 8 responded to the NDDOH's October 21, 1999, letter in a letter dated February 1, 2000, which is docket document EPA-HQ-OAR-2006-0888-0607.12. This EPA letter states: "We have reviewed the methodology used in the modeling analysis, and we believe that the State has conducted a technically sound modeling analysis." The letter also states in apparent contradiction: "However, we believe there should be more discussion in the report that documents how the source emissions inventory was derived for the Class I increment and visibility analysis. It is not clear what the numbers in the major source inventory (Table 4-1) represent or how the emissions data was calculated. The report should also include documentation of the minor source emission

[31] See *The PSD Variance Issue in North Dakota*, §§ 2.2 and 2.4, which is Attachment H to NDDH's 2005 PSD Periodic Review Findings and Report to EPA (ND's 2005 PR Findings and Report). EPA did not convey any policy interpretation of the CAA as requiring a SIP revision to eliminate this modeled violation during years 1978 through 1999 during NDDH permitting actions. These modeled violations were the result of the modeling methods and practices at the time – methods and practices which are now obsolete and which were used without assessments for bias in model-estimated concentrations.

[32] This draft report is docket document EPA-HQ-OAR-2006-0888-607.2.

inventory that was used in the analysis." During the remainder of year 2000, additional correspondence was exchanged.

3) Later, the NDDOH and EPA Region 8 met and discussed PSD sulfur dioxide increment issues, including "additional time to update and refine the increment consumption analyses based upon 1999 and 2000 stationary source emissions data."[33] EPA Region 8 replied in a letter dated March 28, 2001 with its summation of the meeting.[34] In this letter, Region 8 states: "In our January 10, 2001 meeting, you explained that the State needs to refine its previous [Minnkota] analysis before you could determine the appropriate control strategy to address the violations. … you pledged that the State would initiate refinements to the modeling analysis … We acknowledge that the State needs to refine the modeling analysis … and we look forward to working with you and your staff to determine an acceptable modeling protocol."[35]

In sum, EPA Region 8's February 1, 2000 letter, which acknowledged that the Minnkota modeling was draft and that documentation and refinements of emissions inventories were needed, occurred before the NDDOH's April 14, 2000 letter to Minnkota, which was based upon draft modeling. Furthermore, EPA Region 8's March 28, 2001 letter again indicated that the NDDH needed to refine the Minnkota modeling analysis in a broad sense larger than just refining emissions inventories.

The draft Minnkota modeling was the NDDOH's first-time use of the Calmet and Calpuff models.[36,37] Sulfur dioxide emissions inventories used

[33] See letter dated March 13, 2001 by Francis J. Schwindt, NDDH, to Richard R. Long, EPA, which is Exhibit 130 of North Dakota's Periodic Review Record.

[34] See letter by Richard R. Long, EPA, to Francis J. Schwindt, NDDH, which is Exhibit 131 of North Dakota's Periodic Review Record.

[35] See also May 2000 oral testimony of Richard Long, EPA Region 8, in *Transcript of Hearing -- Before the North Dakota Department of Health*, Vol. I, which is Exhibit 48 of North Dakota's Periodic Review Record. "Consequently, in March – consequently, in a March 13th, 2001, letter to EPA, the North Dakota Department of Health committed to update and refine its modeling analysis …" (Id., page 59) "In a letter dated March 28, 2001, we … acknowledged that the State wanted to refine the modeling analysis …" (Id., page 60.)

[36] Models used by the NDDH prior to 1999 for PSD class I increment consumption assessments included RAMR in 1977-78 and MSPUFF in 1981-92, which was a NDDH modified version of the MESOPUFF

in the draft Minnkota modeling analysis were reviewed and found deficient, needing refinement, for these reasons:

1) No documentation for the major source inventory of increment-affecting sulfur dioxide emissions (table 4-1) was provided in the draft Minnkota report. This inventory is the difference between a source's current-time and baseline emissions. The methods for determining the current-time and baseline emissions were not included in the draft Minnkota report. Later, the methods were explained as follows: "Emissions at the date of concern and at the baseline date [were] represented as the time-constant difference between permit allowed 3-hr rolling average emission rate and potential peak emission rate at baseline … [which was] based upon maximum short-term coal-feed rate and maximum coal sulfur. However, source netting was applied at GRE's Stanton Unit 1 when Unit 10 was permitted so both units did not exceed Unit-1's 24-hr … rate calculated as 4,416 lb/hr."[38]

2) A current-time sulfur dioxide emissions inventory for minor sources, i.e., oil and gas production flares and treaters, was included; but no baseline inventory was included. Consequently, the current-time emissions of all minor sources consumed increment without offset by baseline emissions of minor sources. The baseline emissions inventory for these sources was developed and first used subsequent to the draft Minnkota analysis for NDDOH's draft 2002 periodic review modeling.[39]

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model that had been approved by EPA Region 8. See *The PSD Variance Issue in North Dakota*, § 2.4.1, which is Attachment H to ND's 2005 PR Findings and Report.

[37] Modeling methods (protocols) were refined for the NDDOH's draft 2002 modeling, once again for its draft 2003 modeling and again for its EPA and State MOU modeling. See *Background Discussion of Model Input Data and Potential Refinements*, §1, which is Attachment I to ND's PR Findings and Report. See also *Responses to Recurring Issues Related to North Dakota's Computer Modeling of Sulfur Dioxide in CAA PSD Class I Areas*, § 7.1, which is docket document EPA-HQ-OAR-2006-0888-0590.7.

[38] See the NDDOH's *Evaluation of 'EPA Comments on NDDOH's Proposed Determination Regarding the Adequacy of the SIP to Protect PSD Increment for Sulfur Dioxide*, figure 2, which is Exhibit 82 of North Dakota's Periodic Review Record. See also *The Historical Application of Prevention of Significant Deterioration in North Dakota from 1975 through 1999*, § 2.1.1 (page 8), which is Exhibit 133 in North Dakota's Periodic Review Record.

[39] See the NDDOH's *Evaluation of 'EPA Comments on NDDOH's Proposed Determination Regarding the Adequacy of the SIP to Protect PSD Increment for Sulfur Dioxide'*, figure 2, which is Exhibit 82 of North

3) The only documentation for the NDDOH's current-time minor source emissions inventory at the time of the draft Minnkota report was provided in that draft Minnkota report at §4.1, which does not indicate the time period for the inventory.[40] It is likely that oil and gas production data for years 1991-92 were used to create the emissions inventory.[41]

4) No documentation for current-time source emissions used for the Calpuff model performance evaluation described in Appendix B of the draft Minnkota report was provided. "SO_2 emission rates for the significant North Dakota sources were determined separately for each year [1990-1994], based on actual emission reports for the period." Emission rate data for major sources used in the evaluation were not given. And use of actual emissions in the evaluation would not represent bias in the model-estimated changes in concentrations of the draft Minnkota modeling, which used increment-affecting emissions.

5) The then-current definition of actual emissions allowed a reviewing authority to presume that allowable emissions reflect the amount actually emitted, unless that authority had reason to believe that allowable emissions were not representative of the amount actually emitted.[42] However, "[t]he presumption that federally enforceable source-specific requirements correctly reflect actual operating conditions should be rejected by EPA or a state, if reliable evidence is available which shows that actual emissions

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Dakota's Periodic Review Record. Documentation for the baseline minor source emissions inventory was prepared. See April 2002 Prevention of Significant Deterioration Sulfur Dioxide Baseline Emission Rates at pages 79-83, which is Exhibit 4 in North Dakota's Periodic Review Record. See also May 2003 *Prevention of Significant Deterioration Sulfur Dioxide Final Baseline Emission Rates* at pages 90-102, which is Exhibit 83 in North Dakota's Periodic Review Record.

[40] The preparation of oil and gas production inventories for the draft Minnkota modeling followed a procedure established for the *Williston Basin Regional Air Quality Study*, § 4.2, which had been completed in 1990, per NDDH staff meteorologist Steve Weber.

[41] See *Calpuff Class I Area Analysis for [the] Milton R. Young Generating Station*, Appendix B.

[42] 45 Fed. Reg. at 52,705.

differ form the level established in the SIP or the permit."[43] Continuous emissions monitoring (CEM) systems for sulfur dioxide were installed by the state's major sources during the late 1990s. These systems provided hourly data for sulfur dioxide actually emitted.

VI. Following the NDDOH's draft Minnkota report in 1999, which used model worst-case screening methods, and an EPA Region 8 letter in February 2000, the NDDOH began exploring the response sensitivity of model-estimated concentrations for a better, refined modeling protocol.

The environmental groups submitted docket document EPA-HQ-OAR-2006-0888-0607.10, which are NDDOH tables of draft, preliminary modeling results. The NDDOH did not publish these tables; nor did it prepare any documentation for the modeling methods and results listed in these tables.

After EPA agreed in writing that a refining of the sulfur dioxide emissions data used in the 1999 draft Minnkota analysis and report were needed, the NDDOH examined several modeling input and output scenarios.[44] These scenarios are listed in the first and second pages of the docket document. The remaining pages of tables are additional details of results summarized on the first page. A brief description of reasons for the various modeling scenarios follows.

1) The 1st scenario replays results from the 1999 draft Minnkota Report. The 2nd scenario tested the affect the sulfur dioxide emissions of baseline electric generating units still operating during current-period years on a) model-estimated changes in ambient concentrations by

[43] Id. at 52718. This approach replaced use of allowable emissions: "…EPA's June 1978 policy required increment calculations to be based on emissions allowed under a permit of SIP and not on actual source emissions." Id. at 52720.

[44] "An air quality analysis should begin with a screening model to determine the potential of the proposed source or control strategy to violate the PSD increment or NAAQS." See Appendix W, § 10.2.1.b. "If the concentration estimates for the screening techniques indicate a significant impact or that the PSD increment or NAAQS may be approached or exceeded, then a more refined modeling analysis is appropriate …" Id., § 10.2.1.c.

excluding these sources and b) sulfur dioxide PSD class I 24-hour increment consumption.

2) The 3rd scenario is a replay of draft results of EPA Region 8 modeling at the time, which were based on 1999-2000 CEM sulfur dioxide emissions.

3) The 4th, 5th and 6th scenarios used only one year (2000) of sulfur dioxide emissions to examine the affect of use of 90th percentile emissions rates for major sources, the affect the emissions of baseline electric generating units still operating on modeled changes in ambient concentrations by excluding these sources, and the effect of the emissions of oil and gas flares and treaters on model-estimated changes in concentrations, respectively.

4) The 7th, 8th and 9th scenarios used years 2000-01 annual sulfur dioxide emissions averaged during operating hours (per rule defined "actual emissions") to examine the affect on modeled-estimated changes in ambient concentrations. Scenario 8 adds baseline major sources to scenario 7 and scenario 9 adds oil and gas sources to scenario 8.

5) In scenarios 1 through 9, model-estimated changes in ambient concentrations were tabulated at individual model receptors in PSD class I areas.

6) The 10th, 11th and 12th scenario sulfur dioxide emissions follow the emissions for the 7th, 8th and 9th scenarios. Here model-estimated changes in ambient concentrations were tabulated from averages of model-estimated concentrations among receptors in a class I area for each 24-hour and 3-hour period. This approach was used because the FLAG guidance indicates that AQRVs for deposition and visibility are not point but area ($/m^2$) and line of sight ($distince^{-1}$) dependent, respectively.[45]

[45] See the NDDOH's *Responses to Recurring Issues Related to North Dakota's Computer Modeling of Sulfur Dioxide in CAA PSD Class I Areas*, which is docket document EPA-HQ-OAR-2006-0888-0590.5, at page 20.

7) The 13th, 14th and 15th scenarios parallel the 7th, 8th and 9th scenarios, but used year 2000 hourly CEM sulfur dioxide emissions, rather than "actual emissions", of major sources. In prior correspondence, EPA Region 8 indicated: "The most accurate way to characterize the increment expansion (or consumption) from a source of this type would be to use continuous in-stack emission monitoring data from these sources in the dispersion modeling effort. These hourly data would be paired with meteorological data taken at the same time and used in the modeling. This method would take into account the effect of both emissions and meteorological variability."[46]

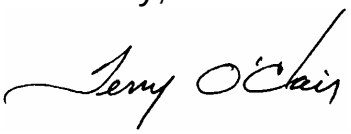
In sum, the various modeling scenarios explored source-in/source-out affects under four options for expression of sulfur dioxide emissions (allowables, 90th percentiles, "actual emissions", and hourly CEM emissions) and two options for tabulating changes in model-estimated concentrations after baseline (for each receptor and for the receptor network). The results were draft, never documented, never promulgated, and provided legal and technical focus for the NDDOH's modeling protocols throughout the years 2002 through 2004.

[46] See letter dated June 1, 1999, by Richard R. Long, EPA, to Dana Mount, NDDOH, which is Exhibit 128 of North Dakota's Periodic Review Record. The NDDOH subsequently demonstrated that this method does not improve the accuracy of model-estimated concentrations.

VII. Conclusion.

Thank you for the opportunity to file these additional comments. We hope they are helpful in addressing some of the many issues raised by comments filed in this rulemaking.

Sincerely,



Terry O'Clair, Director
Division of Air Quality
North Dakota Department of Health

Attachments incorporated:

A - *"Supplemental Comments on EPA's Proposed Rule Revisions"*

B - *"CAA Amendments of 1977 - House Conference Report No. 95-564 (Aug. 3, 1977), pp. 1077, 1502, 1529, 1530-1534"*

C – *CAA Amendments of 1977 – Senate Report No. 95-127 (May 10, 1977), pp. 11-12, 27-37, 97-98"*

D – *Paper Offsets Problem*

E – *Gulf Coast Problem*

F – October 21, 1999, letter from Dana Mount to EPA Region 8

cc: Terry Dwelle, M.D., M.P.H.T.M.
State Health Officer

David Glatt, Environmental Chief, NDDOH

Wayne Stenehjem
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